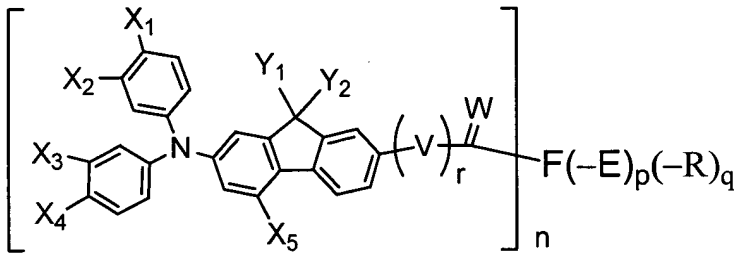
WHAT IS CLAIMED IS:

1. A compound of the following formula:



wherein

F is a fullerene core;

E is Y_1,Y_2-amino, Y_2-amino, (Y_1,Y_2-alkyl)-amino, Y_1,Y_2-ethylenediamino, (dihydroxymethyl)alkylamino, (X_1,X_3-aryl)amino, X_1,X_3-aryloxy, Y_2-alkoxy, Y_1,Y_2-alkoxy, (Y_1,Y_2-amino)alkoxy, (Y_1,Y_2,Y_3-aryl)oxy, (dihydroxyalkyl)-aryloxy, (Y_1,Y_2,Y_3-alkyl)amino, (Y_1,Y_2,Y_3-aryl)amino, dihydroxyalkylamino, Y_1,Y_2,Y_3-alkoxy, (trihydroxyalkyl)alkoxy, (trihydroxyalkyl)alkylamino, (dicarboxyalkyl)amino, Y_2-thio, (Y_1,Y_2,Y_3-alkyl)thio, (X_1,X_3-aryl)thio, (Y_1,Y_2-alkyl)thio, (dihydroxyalkyl)thio, Y_1,Y_2-dioxoalkyl, tri-(Y_1,Y_2,Y_3-methylaminocarboxyethyl)methylamino, ((glycosidyl)oxoheteroaryl)amino, ((glycosidyl)oxoaryl)amino, (X_1,X_2,X_3-heteroaryl)amino, (X_1-diarylketone)amino, (T,X_1-oxoaryl)amino, (T,X_1-dioxoaryl)amino, (Y_1-alkyl,Y_2-alkyldioxoheteroaryl)amino, (Y_1-alkyl,Y_2-alkyldioxoaryl)amino, (di(Y_1,Y_2-methyl)dioxoheteroaryl)amino, (di(Y_1,Y_2-methyl)dioxoaryl)amino, ((glycosidyl)heteroaryl)amino, ((glycosidyl)aryl)amino, ((carboxylacetylalkyl)oxo-heteroaryl)amino, ((carboxylacetylalkyl)oxoaryl)amino, ((isopropylaminohydroxy-alkoxy)aryl)amino, (X_1,X_2,X_3-alkylaryl)amino, (X_1,X_2,X_3-heteroaryl)oxy, (isopropylaminohydroxyalkyl)aryloxy, (X_1,X_2,X_3-oxoheteroaryl)oxy, (X_1,X_2,X_3-oxoaryl)oxy, (X_1,Y_1-oxoheteroaryl)oxy, (X_1-diarylketone)oxy, (T,X_1-oxoaryl)oxy, (X_1,X_2-dioxoaryl)oxy, (Y_1,Y_2,di-aminodihydroxy)alkyl, (X_1,X_2-heteroaryl)thio, ((tricarboxylalkyl)ethylene-diamino)alkoxy, (X_1,X_2-oxoaryl)thio, (X_1,X_2-dioxoaryl)thio, (glycosidylheteroaryl)thio, (glycosidylaryl)thio, Y_1-alkyl(thiocarbonyl)thio, Y_1,Y_2,-alkyl(thiocarbonyl)thio, Y_1,Y_2,Y_3-alkyl(thiocarbonyl)thio, (Y_1,Y_2-aminothiocarbonyl)thio, (pyranosyl)thio, cysteinyl, tyrosinyl, (phenylalainyl)amino, (dicarboxyalkyl)thio, (aminoaryl)$_{1\text{-}100}$amino, (pyranosyl)$_{1\text{-}100}$amino, (Y_1-aminoaryl)$_{1\text{-}100}$amino,

(amino(sulfoaryl))$_{1-100}$amino, peptidyl, thymidinyl, uridinyl, guanosinyl, adenosinyl, cholesteryl, or biotinylalkoxy; each T, independently, being halo;

each of X_1, X_2, X_3, X_4, and X_5, independently, is $-Y_2$, $-O-Y_2$, $-S-Y_2$, $-NH-Y_2$, $-CO-O-Y_2$, $-O-CO-Y_2$, $-CO-NH-Y_2$, $-CO-NY_1Y_2$, $-NH-CO-Y_2$, $-SO_2-Y_2$, $-SO_2-O-Y_2$, $-CHY_1Y_2$, or $-NY_1Y_2$;

each of Y_1, Y_2, and Y_3, independently or taken together, is -B-Z or -Z; in which each B, independently, is $-R^a-O-[Si(CH_3)_2-O-]_{1-100}$, C_{1-2000} alkyl, C_{6-40} aryl, C_{7-2000} alkylaryl, C_{7-2000} arylalkyl, (C_{1-30} alkyl ether)$_{1-100}$, (C_{6-40} aryl ether)$_{1-100}$, (C_{7-2000} alkylaryl ether)$_{1-100}$, (C_{7-2000} arylalkyl ether)$_{1-100}$, (C_{1-30} alkyl thioether)$_{1-100}$, (C_{6-40} aryl thioether)$_{1-100}$, (C_{7-2000} alkylaryl thioether)$_{1-100}$, (C_{7-2000} arylalkyl thioether)$_{1-100}$, (C_{2-50} alkyl ester)$_{1-100}$, (C_{7-2000} aryl ester)$_{1-100}$, (C_{8-2000} alkylaryl ester)$_{1-100}$, (C_{8-2000} arylalkyl ester)$_{1-100}$, $-R^a-CO-O-$(C_{1-30} alkyl ether)$_{1-100}$, $-R^a-CO-O-$(C_{6-40} aryl ether)$_{1-100}$, $-R^a-CO-O-$(C_{7-2000} alkylaryl ether)$_{1-100}$, $-R^a-CO-O-$(C_{7-2000} arylalkyl ether)$_{1-100}$, (C_{4-50} alkyl urethane)$_{1-100}$, (C_{14-60} aryl urethane)$_{1-100}$, ($C_{10-2000}$ alkylaryl urethane)$_{1-100}$, ($C_{10-2000}$ arylalkyl urethane)$_{1-100}$, (C_{5-50} alkyl urea)$_{1-100}$, (C_{14-60} aryl urea)$_{1-100}$, ($C_{10-2000}$ alkylaryl urea)$_{1-100}$, ($C_{10-2000}$ arylalkyl urea)$_{1-100}$, (C_{2-50} alkyl amide)$_{1-100}$, (C_{7-60} aryl amide)$_{1-100}$, (C_{8-2000} alkylaryl amide)$_{1-100}$, (C_{8-2000} arylalkyl amide)$_{1-100}$, (C_{3-30} alkyl anhydride)$_{1-100}$, (C_{8-50} aryl anhydride)$_{1-100}$, (C_{9-2000} alkylaryl anhydride)$_{1-100}$, (C_{9-2000} arylalkyl anhydride)$_{1-100}$, (C_{2-30} alkyl carbonate)$_{1-100}$, (C_{7-50} aryl carbonate)$_{1-100}$, (C_{8-2000} alkylaryl carbonate)$_{1-100}$, (C_{8-2000} arylalkyl carbonate)$_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{1-30} alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether)$_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{2-50} alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester)$_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{1-30} alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether)$_{1-100}$-CO-NH-(R^b or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{2-50} alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester)$_{1-100}$-R^c-O-CO-NH-(R^b or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{1-30} alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether)$_{1-100}$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{2-50} alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester)$_{1-100}$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{1-30} alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether)$_{1-100}$-CO-NH-(R^b or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$(C_{2-50} alkyl ester, C_{7-60} aryl ester, C_{8-2000}

alkylaryl ester, or C_{8-2000} arylalkyl ester)$_{1-100}$-R^c-O-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-O-, -R^a-O-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-NH-(C_{2-50} alkyl amide, C_{7-60} aryl amide, C_{8-2000} alkylaryl amide, or C_{8-2000} arylalkyl amide)$_{1-100}$, or -R^a-NH-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-NH-(C_{2-50} alkyl amide, C_{7-60} aryl amide, C_{8-2000} alkylaryl amide, or C_{8-2000} arylalkyl amide)$_{1-100}$; and each Z, independently, is -H or -G-D, wherein G is -R^a-, -R^a-Ar-, -Ar-R^a-, or -Ar-; and D is -H, -OH, -SH, -NH_2, -NHOH, -SO_3H, -OSO_3H, -CO_2H, -$CONH_2$, -$CONHNH_2$, -$CH(NH_2)$-CO_2H, -NH-CH_2-CO_2H, -$P(OH)_3$, -$PO(OH)_2$, -O-$PO(OH)_2$, -O-PO(OH)-O-$PO(OH)_2$, -O-$PO(O^-)$-O-$CH_2CH_2NH_3^+$, -O-$PO(O^-)$-O-CH_2CH_2-$N^+(CH_3)_3$, -glycoside, -oligosaccharide, -CO-glycoside, -CO-oligosaccharide, -OCH_3, -$OCH_2(CHOH)_4$-CH_2OH, -$OCH_2(CHOH)_2$-CH_2OH, -CO-$OCH_2(CHOH)_4$-CH_2OH, -$C_6H_3(OH)_2$, -$N(CH_2CO_2H)_2$, -CO-$N(CH_2CO_2H)_2$, -CO-NH-$C(CH_2CH_2CO_2H)_3$, -CO-NH-$C(CH_2CH_2OH)_3$, -[CH_2-$CH(CO_2R^a)$]$_{1-100}$-H, -NH_3^+, -$N^+H_2R^a$, -$N^+HR^aR^b$, or -$N^+R^aR^bR^c$; each of R^a, R^b, and R^c, independently, being C_{1-20} linear or branched alkyl, and Ar being aryl;

R is hydroxy or amino;

W is O, $C(CN)_2$, $N^+Y_1Y_2$, or V;

V is C_{5-20} aryl or C_{2-20} heteroaryl;

n is 1-10;

p is 0-20;

q is 0-20; and

r is 0 or 1.

2. The compound of claim 1, wherein F is a fullerene core of C_{60}, C_{70}, C_{76}, C_{78}, C_{82}, C_{84}, C_{92} (methano)$_n$$C_{60}$, (pyrrolidino)$_n$$C_{60}$, La@$C_s$, Ho@$C_s$, Gd@$C_s$, or Er@$C_s$, in which n is 1-10, and s is 60, 74, or 82.

3. The compound of claim 2, wherein F is a fullerene core of C_{60}, C_{70}, or C_{84}.

4. The compound of claim 1, wherein each of X_1, X_2, X_3, X_4, and X_5, independently, is hydrogen.

5. The compound of claim 1, wherein each of Y_1, Y_2, and Y_3, independently, is hydrogen, $C_{1\text{-}2000}$ alkyl, $C_{6\text{-}40}$ aryl, or $C_{7\text{-}2000}$ arylalkyl, optioanlly substituted with -OH, -SH, $-NH_2$, -NHOH, $-SO_3H$, $-OSO_3H$, $-CO_2H$, $-CONH_2$, $-CONHNH_2$, $-CH(NH_2)-CO_2H$, $-NH-CH_2-CO_2H$, $-NH_3^+$, $-N^+H_2R^a$, $-N^+HR^aR^b$, or $-N^+R^aR^bR^c$,

6. The compound of claim 1, wherein each of Y_1, Y_2, and Y_3, independently, is ethyl, hydroxyethyl, methoxyethyl, solfonylbutoxyethyl, hydroxycarbonylmethyl, or hydroxycarbonylethyl.

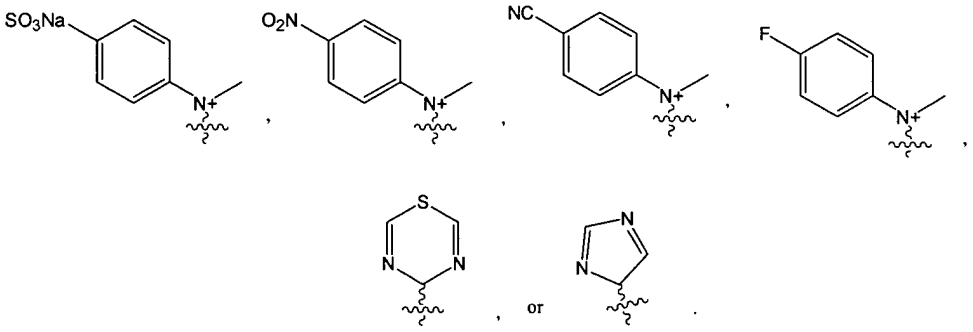
7. The compound of claim 1, wherein r is 0.

8. The compound of claim 1, wherein r is 1, and V is aryl.

9. The compound of claim 8, wherein V is phenyl.

10. The compound of claim 1, wherein W is O, $C(CN)_2$, heteroaryl, $N^+Y_1Y_2$, each of Y_1 and Y_2, independently, being hydrogen, alkyl, aryl, or heteroaryl, or, together, being ary or heteroaryl.

11. The compound of claim 10, wherein W is O, $C(CN)_2$,



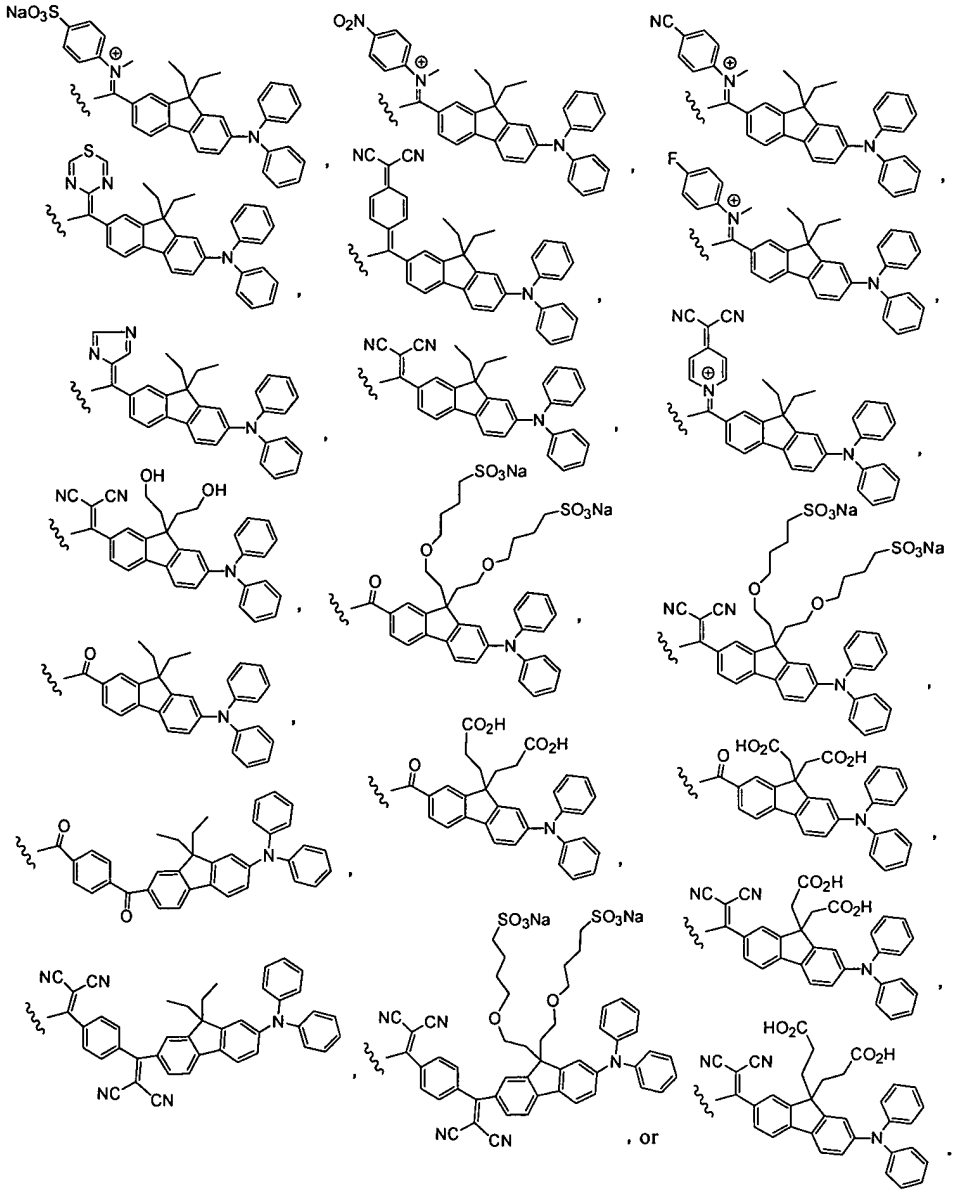
12. The compound of claim 1, wherein E is Y_1,Y_2-amino, Y_2-amino, (Y_1,Y_2-alkyl)-amino, Y_1,Y_2-ethylenediamino, (dihydroxymethyl)alkylamino, (X_1,X_3-aryl)amino, (Y_1,Y_2,Y_3-alkyl)amino, (Y_1,Y_2,Y_3-aryl)amino, dihydroxyalkylamino, (trihydroxyalkyl)alkylamino, or (dicarboxyalkyl)amino; and p is 1-4.

13. The compound of claim 12, wherein E is diphenylamino.

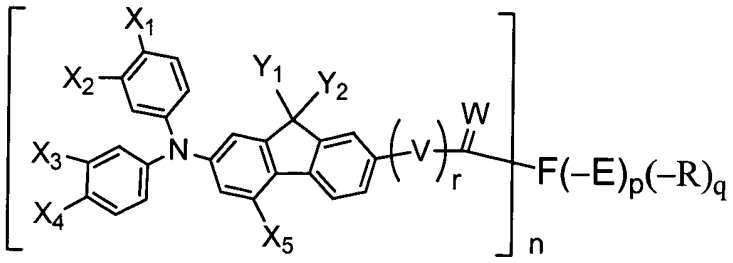
14. The compound of claim 1, wherein R is hydroxy or amino.

15. The compound of claim 1, wherein q is 0.

16. The compound of claim 1, wherein the compound is of the following structure of $F(-M)_n$, in which F is a fullerene core of C_{60}, n is 1-6, each M, independently, is



17. A pharmaceutical composition, comprising a pharmaceutically acceptable carrier and a compound of the following formula:



wherein

F is a fullerene core;

E is Y_1,Y_2-amino, Y_2-amino, (Y_1,Y_2-alkyl)-amino, Y_1,Y_2-ethylenediamino, (dihydroxymethyl)alkylamino, (X_1,X_3-aryl)amino, X_1,X_3-aryloxy, Y_2-alkoxy, Y_1,Y_2-alkoxy, (Y_1,Y_2-amino)alkoxy, (Y_1,Y_2,Y_3-aryl)oxy, (dihydroxyalkyl)-aryloxy, (Y_1,Y_2,Y_3-alkyl)amino, (Y_1,Y_2,Y_3-aryl)amino, dihydroxyalkylamino, Y_1,Y_2,Y_3-alkoxy, (trihydroxyalkyl)alkoxy, (trihydroxyalkyl)alkylamino, (dicarboxyalkyl)amino, Y_2-thio, (Y_1,Y_2,Y_3-alkyl)thio, (X_1,X_3-aryl)thio, (Y_1,Y_2-alkyl)thio, (dihydroxyalkyl)thio, Y_1,Y_2-dioxoalkyl, tri-(Y_1,Y_2,Y_3-methylaminocarboxyethyl)methylamino, ((glycosidyl)oxoheteroaryl)amino, ((glycosidyl)oxoaryl)amino, (X_1,X_2,X_3-heteroaryl)amino, (X_1-diarylketone)amino, (T,X_1-oxoaryl)amino, (T,X_1-dioxoaryl)amino, (Y_1-alkyl,Y_2-alkyldioxoheteroaryl)amino, (Y_1-alkyl,Y_2-alkyldioxoaryl)amino, (di(Y_1,Y_2-methyl)dioxoheteroaryl)amino, (di(Y_1,Y_2-methyl)dioxoaryl)amino, ((glycosidyl)heteroaryl)amino, ((glycosidyl)aryl)amino, ((carboxylacetylalkyl)oxo-heteroaryl)amino, ((carboxylacetylalkyl)oxoaryl)amino, ((isopropylaminohydroxy-alkoxy)aryl)amino, (X_1,X_2,X_3-alkylaryl)amino, (X_1,X_2,X_3-heteroaryl)oxy, (isopropylaminohydroxyalkyl)aryloxy, (X_1,X_2,X_3-oxoheteroaryl)oxy, (X_1,X_2,X_3-oxoaryl)oxy, (X_1,Y_1-oxoheteroaryl)oxy, (X_1-diarylketone)oxy, (T,X_1-oxoaryl)oxy, (X_1,X_2-dioxoaryl)oxy, (Y_1,Y_2,di-aminodihydroxy)alkyl, (X_1,X_2-heteroaryl)thio, ((tricarboxylalkyl)ethylene-diamino)alkoxy, (X_1,X_2-oxoaryl)thio, (X_1,X_2-dioxoaryl)thio, (glycosidylheteroaryl)thio, (glycosidylaryl)thio, Y_1-alkyl(thiocarbonyl)thio, Y_1,Y_2,-alkyl(thiocarbonyl)thio, Y_1,Y_2,Y_3-alkyl(thiocarbonyl)thio, (Y_1,Y_2-aminothiocarbonyl)thio, (pyranosyl)thio, cysteinyl, tyrosinyl, (phenylalainyl)amino, (dicarboxyalkyl)thio, (aminoaryl)$_{1\text{-}100}$amino, (pyranosyl)$_{1\text{-}100}$amino, (Y_1-aminoaryl)$_{1\text{-}100}$amino,

(amino(sulfoaryl))ī100amino, peptidyl, thymidinyl, uridinyl, guanosinyl, adenosinyl, cholesteryl, or biotinylalkoxy; each T, independently, being halo;

each of X_1, X_2, X_3, X_4, and X_5, independently, is $-Y_2$, $-O-Y_2$, $-S-Y_2$, $-NH-Y_2$, $-CO-O-Y_2$, $-O-CO-Y_2$, $-CO-NH-Y_2$, $-CO-NY_1Y_2$, $-NH-CO-Y_2$, $-SO_2-Y_2$, $-SO_2-O-Y_2$, $-CHY_1Y_2$, or $-NY_1Y_2$;

each of Y_1, Y_2, and Y_3, independently or taken together, is -B-Z or -Z; in which each B, independently, is $-R^a-O-[Si(CH_3)_2-O-]_{1-100}$, C_{1-2000} alkyl, C_{6-40} aryl, C_{7-2000} alkylaryl, C_{7-2000} arylalkyl, $(C_{1-30}$ alkyl ether$)_{1-100}$, $(C_{6-40}$ aryl ether$)_{1-100}$, $(C_{7-2000}$ alkylaryl ether$)_{1-100}$, $(C_{7-2000}$ arylalkyl ether$)_{1-100}$, $(C_{1-30}$ alkyl thioether$)_{1-100}$, $(C_{6-40}$ aryl thioether$)_{1-100}$, $(C_{7-2000}$ alkylaryl thioether$)_{1-100}$, $(C_{7-2000}$ arylalkyl thioether$)_{1-100}$, $(C_{2-50}$ alkyl ester$)_{1-100}$, $(C_{7-2000}$ aryl ester$)_{1-100}$, $(C_{8-2000}$ alkylaryl ester$)_{1-100}$, $(C_{8-2000}$ arylalkyl ester$)_{1-100}$, $-R^a-CO-O-(C_{1-30}$ alkyl ether$)_{1-100}$, $-R^a-CO-O-(C_{6-40}$ aryl ether$)_{1-100}$, $-R^a-CO-O-(C_{7-2000}$ alkylaryl ether$)_{1-100}$, $-R^a-CO-O-(C_{7-2000}$ arylalkyl ether$)_{1-100}$, $(C_{4-50}$ alkyl urethane$)_{1-100}$, $(C_{14-60}$ aryl urethane$)_{1-100}$, $(C_{10-2000}$ alkylaryl urethane$)_{1-100}$, $(C_{10-2000}$ arylalkyl urethane$)_{1-100}$, $(C_{5-50}$ alkyl urea$)_{1-100}$, $(C_{14-60}$ aryl urea$)_{1-100}$, $(C_{10-2000}$ alkylaryl urea$)_{1-100}$, $(C_{10-2000}$ arylalkyl urea$)_{1-100}$, $(C_{2-50}$ alkyl amide$)_{1-100}$, $(C_{7-60}$ aryl amide$)_{1-100}$, $(C_{8-2000}$ alkylaryl amide$)_{1-100}$, $(C_{8-2000}$ arylalkyl amide$)_{1-100}$, $(C_{3-30}$ alkyl anhydride$)_{1-100}$, $(C_{8-50}$ aryl anhydride$)_{1-100}$, $(C_{9-2000}$ alkylaryl anhydride$)_{1-100}$, $(C_{9-2000}$ arylalkyl anhydride$)_{1-100}$, $(C_{2-30}$ alkyl carbonate$)_{1-100}$, $(C_{7-50}$ aryl carbonate$)_{1-100}$, $(C_{8-2000}$ alkylaryl carbonate$)_{1-100}$, $(C_{8-2000}$ arylalkyl carbonate$)_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{1-30}$ alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether$)_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{2-50}$ alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester$)_{1-100}$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{1-30}$ alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether$)_{1-100}-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{2-50}$ alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester$)_{1-100}-R^c-O-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{1-30}$ alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether$)_{1-100}$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{2-50}$ alkyl ester, C_{7-60} aryl ester, C_{8-2000} alkylaryl ester, or C_{8-2000} arylalkyl ester$)_{1-100}$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{1-30}$ alkyl ether, C_{6-40} aryl ether, C_{7-2000} alkylaryl ether, or C_{7-2000} arylalkyl ether$)_{1-100}-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-$, $-R^a-NH-CO-NH-(R^b$ or $Ar-R^b-Ar)-NH-CO-O-(C_{2-50}$ alkyl ester, C_{7-60} aryl ester, C_{8-2000}

alkylaryl ester, or C_{8-2000} arylalkyl ester)$_{1-100}$-R^c-O-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-O-, -R^a-O-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-NH-(C_{2-50} alkyl amide, C_{7-60} aryl amide, C_{8-2000} alkylaryl amide, or C_{8-2000} arylalkyl amide)$_{1-100}$, or -R^a-NH-CO-NH-(R^b or Ar-R^b-Ar)-NH-CO-NH-(C_{2-50} alkyl amide, C_{7-60} aryl amide, C_{8-2000} alkylaryl amide, or C_{8-2000} arylalkyl amide)$_{1-100}$; and each Z, independently, is -H or -G-D, wherein G is -R^a-, -R^a-Ar-, -Ar-R^a-, or -Ar-; and D is -H, -OH, -SH, -NH_2, -NHOH, -SO_3H, -OSO_3H, -CO_2H, -$CONH_2$, -$CONHNH_2$, -$CH(NH_2)$-CO_2H, -NH-CH_2-CO_2H, -$P(OH)_3$, -$PO(OH)_2$, -O-$PO(OH)_2$, -O-PO(OH)-O-$PO(OH)_2$, -O-$PO(O^-)$-O-$CH_2CH_2NH_3^+$, -O-$PO(O^-)$-O-CH_2CH_2-$N^+(CH_3)_3$, -glycoside, -oligosaccharide, -CO-glycoside, -CO-oligosaccharide, -OCH_3, -$OCH_2(CHOH)_4$-CH_2OH, -$OCH_2(CHOH)_2$-CH_2OH, -CO-$OCH_2(CHOH)_4$-CH_2OH, -$C_6H_3(OH)_2$, -$N(CH_2CO_2H)_2$, -CO-$N(CH_2CO_2H)_2$, -CO-NH-$C(CH_2CH_2CO_2H)_3$, -CO-NH-$C(CH_2CH_2OH)_3$, -$[CH_2$-$CH(CO_2R^a)]_{1-100}$-H, -NH_3^+, -$N^+H_2R^a$, -$N^+HR^aR^b$, or -$N^+R^aR^bR^c$, each of R^a, R^b, and R^c, independently, being C_{1-20} linear or branched alkyl, and Ar being aryl;

R is alkyl, hydroxy, or amino;

W is O, $C(CN)_2$, $N^+Y_1Y_2$, or V;

V is C_{5-20} aryl or C_{2-20} heteroaryl;

n is 1-10;

p is 0-20;

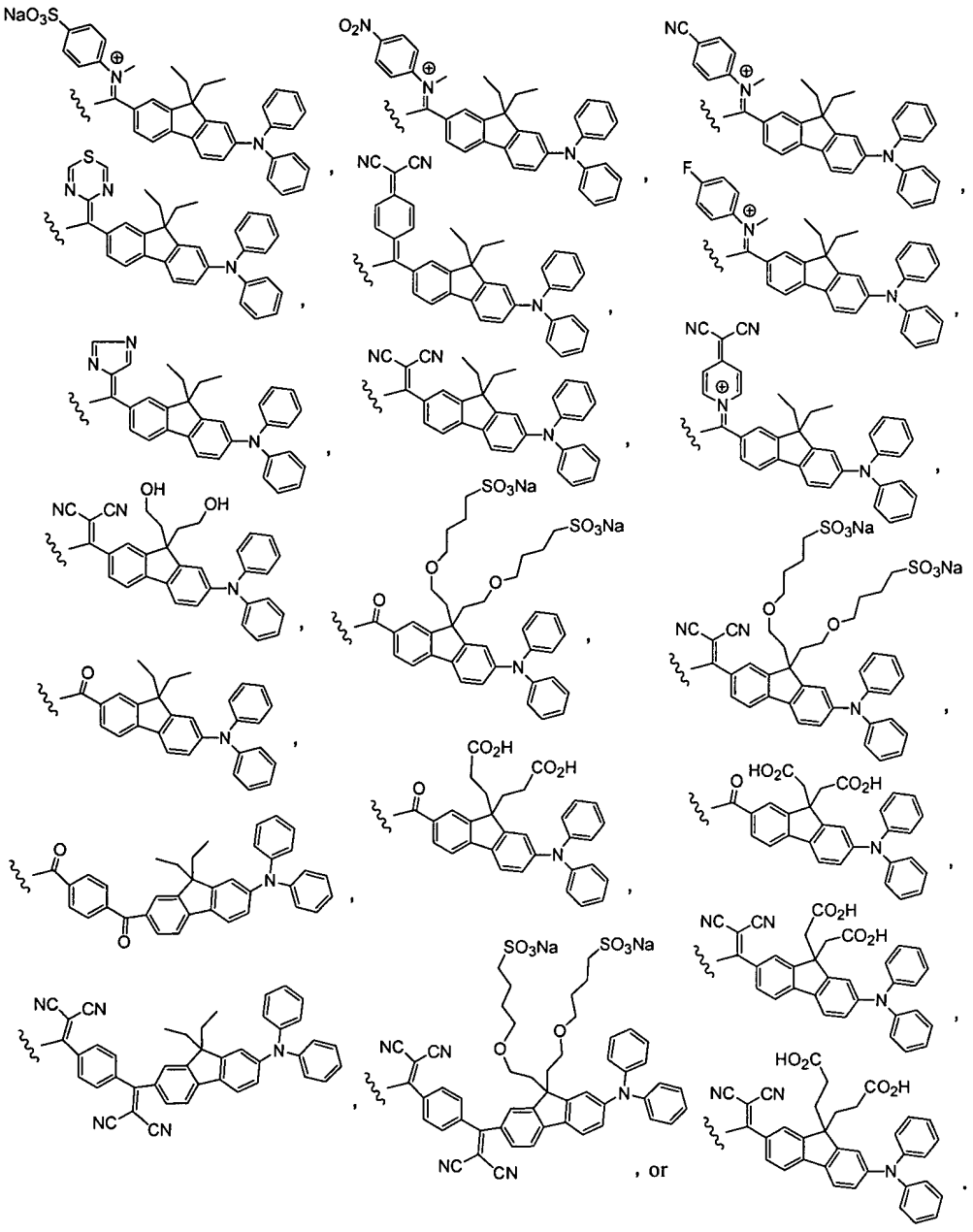
q is 0-20; and

r is 0 or 1.

18. The pharmaceutical composition of claim 17, wherein wherein F is a fullerene core of C_{60}, C_{70}, C_{76}, C_{78}, C_{82}, C_{84}, C_{92} (methano)$_n$$C_{60}$, (pyrrolidino)$_n$$C_{60}$, La@$C_s$, Ho@$C_s$, Gd@$C_s$, or Er@$C_s$, in which n is 1-10, and s is 60, 74, or 82.

19. The pharmaceutical composition of claim 17, wherein each of X_1, X_2, X_3, X_4, and X_5, independently, is hydrogen.

20. The pharmaceutical compoistion of claim 17, wherein the compound is of the following structure of F(-M)$_n$, in which F is a fullerene core of C_{60}, n is 1-6, each M, independently, is:



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